September 17, 2007

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Re: I-93 Exit 4A Interchange Study, Rockingham County, New Hampshire, Draft Environmental Impact Statement, Corps of Engineers File Number 2005-3061, CEQ # 20070317

Dear Mr. O'Donnell and Ms. Godfrey:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA), Section 404 of the Clean Water Act, and Section 309 of the Clean Air Act, we have reviewed the Federal Highway Administration's (FHWA's) Draft Environmental Impact Statement (DEIS) for the I-93 Exit 4A Interchange Study, Rockingham County, New Hampshire.[1]

The DEIS details plans by the towns of Derry and Londonderry to build a new exit and roadway off I-93 in southern New Hampshire. The project purpose is to reduce congestion, primarily along Route 102 through downtown Derry, to improve safety in both towns, and to promote economic development. As proposed, much of the likely development is intended to take place in commercially and industrially zoned land near the new road. The work would consist of improvements to 1.6 miles of existing roadway and the construction of 1 mile of new roadway. According to the DEIS, construction of the new exit and associated roadway improvements will result in direct impacts to aquatic resources including the placement of fill in 3.4 acres of wetlands, including 5 vernal pools; the relocation of 2,350 linear feet of streams; fill in 0.34 acre-feet of floodplain;

[1] This letter serves as our comment on the DEIS and the Corps of Engineers' public notice for a Clean Water Act Section 404 permit for the project.

and bisection of an as of yet undeveloped 200-acre forested area that may contain additional wetland resources.

We understand that one of the purposes of the project is to encourage new development which will promote new jobs and an expanded tax base. EPA also recognizes the towns' desire to reduce traffic congestion and to provide for future economic growth while minimizing the impact of newly generated traffic on existing roadways and neighborhoods.

EPA's past experience with and knowledge of environmental conditions within portions of the I-93 corridor ecosystem helped shape our scoping input for this EIS. During interagency scoping meetings as part of the EIS development/regulatory coordination process, EPA staff offered recommendations concerning a number of issues, including water quality modeling (with a particular focus on chloride (CL) in stormwater); wetland issues; and the analysis of development induced by the project (including changes in population and job growth related to the new exit) and associated impacts. The issue of high chloride levels, well above state water quality standards, has been a well-known concern in New Hampshire and needs to be carefully considered in the EIS. During an interagency scoping meeting on June 13, 2006 (agenda and meeting notes attached) EPA staff discussed stormwater modeling and strongly encouraged the FHWA and the host towns to initiate water quality sampling because real data are needed to establish baseline conditions that would allow FHWA to characterize project related stormwater impacts in the EIS and would help avoid delays in permitting. We also commented on limitations of the model being used to predict stormwater pollution impacts in the EIS and the lack of integration of important baseline conditions (regarding existing pollutant loading in streams and waterbodies) in the model. The need for baseline information stems from recent data characterizing chloride concentrations above state standards for portions of the I-93 corridor, including portions of the I-93 Exit 4A study area.

The DEIS acknowledges that stormwater runoff from the project would exceed state standards at several locations and notes "existing high concentrations of chlorides observed in area streams." To date, issues raised by EPA and other agencies regarding baseline characterization and the subsequent analysis of impacts from stormwater have not been addressed in the EIS. As a result, the DEIS discussion of project impacts associated with pollution from stormwater runoff is incomplete and does not provide adequate information, as required by the NEPA regulations, to characterize the extent and magnitude of stormwater runoff impacts. Therefore, based on our understanding of the project and data generated for the I-93 widening project, we believe the project has great potential to violate New Hampshire's water quality standards with respect to chloride concentrations and that supplemental analysis will be necessary to more fully describe these potential impacts and to facilitate a discussion of mitigation measures.

In addition, we believe additional work is necessary to supplement the current analysis of impacts to wetland resources and the potential for secondary development impacts associated with the commercial/industrial development in Derry/Londonderry that the project is intended to catalyze. Our comments on both of these issues, as well as our

stormwater analysis comments, are discussed in the attachment to this letter.

For the reasons discussed above and described in the attached detailed comments, EPA has rated this DEIS as "Environmental Objections-Insufficient Information" (EO-2) in accordance with EPA's national rating system, a description of which is attached to this letter. We appreciate the opportunity my staff had to discuss these issues on September 6th, 2007 with FHWA, the NH Department of Environmental Services, NHDOT, and the towns' consultant team. As noted in those discussions, it is unfortunate that had the analyses recommended in 2006 scoping meetings been done, the work could have been completed before this DEIS was published. EPA recognizes the importance of this project to Derry and Londonderry and we reiterate our offer to assist FHWA and the towns in any way that we can toward completing the necessary work to resolve these concerns. Please feel free to contact me or Timothy Timmermann of the Office of Environmental Review at 617/918-1025 if you wish to discuss these comments further.

Sincerely,

/s/

Robert W. Varney
Regional Administrator

Enclosure

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC–Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3–Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Additional Detailed Comments
I-93 Exit 4A Interchange Study Derry-Londonderry
Draft Environmental Impact Statement

Wetland/Section 404 Issues

Requirements of Section 404

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into wetlands and other waters of the United States. EPA's § 404(b)(1) guidelines (40 C.F.R. Part 230) set forth the environmental standards which must be satisfied in order for a § 404 permit to issue.[1] Four key provisions of the guidelines are critical when considering the proposed project. First, the guidelines generally prohibit the discharge of dredged or fill material if there exists a practicable alternative which causes less harm to the aquatic ecosystem. Where, as here, the project is not water dependent and could involve fill in wetlands, practicable, less environmentally damaging alternatives are presumed to exist unless clearly demonstrated otherwise. Second, the guidelines prohibit issuance of a permit if the discharge would cause or contribute to a violation of applicable state water quality standards. Third, the guidelines prohibit issuance of a permit if the discharge would cause or contribute to significant degradation of waters of the United States. Finally, the guidelines prohibit issuance of a permit unless all appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge upon the aquatic ecosystem.

Environmental Values

The wetlands to be filled by the proposed project drain to several tributaries that flow into Shields and Beaver Brook, which in turn drain into the Merrimack River, one of the most important aquatic systems in New England. The DEIS states that the wetlands in the study area provide the following principal functions and values: sediment and toxicant retention; wildlife habitat, groundwater recharge and discharge; nutrient retention; and production export. The study area contains a variety of wetlands, vernal pools, and intermittent and perennial streams.

Though many of the wetlands, streams, and uplands in the study area have experienced some degree of cumulative adverse impacts from development, several ecologically valuable areas remain, including one forested block, approximately 200 acres in size, containing many productive vernal pools. The DEIS describes this area as intrinsically valuable and a refuge for local wildlife; we agree with that description.

Vegetated wetlands help maintain the quality of rivers and streams. First, wetlands help remove and retain nutrients, such as nitrogen and phosphorus, which cause eutrophication of natural waters. Second, wetlands process chemical and organic waste products from the water. Third, wetlands also trap sediment which can transport absorbed nutrients, pesticides, heavy metals and other pollutants. Much of this material is either stored in the sediment or converted to useable plant material. Given the high percentage of riparian

[1] The Corps' public interest review regulations must also be satisfied.

wetlands in the study area and that flowing waters of the streams regularly interacts with the soil and vegetation of these wetlands, the wetlands systems are likely especially important for pollutant removal and retention.

The study area also contains many vernal pools, most of which are associated with the 200-acre undeveloped habitat block. Vernal pools are breeding habitats for amphibians and are utilized by other wildlife including turtles and waterfowl. They also support an abundance of invertebrate life that, along with the abundant amphibians, attracts hawks, owls, snakes, turtles, waterfowl and predatory mammals.

Most of the identified pools are highly productive (many egg masses) and have a large influence on the ecology of the larger landscape. The high productivity provides much energy in the form of biomass (individual salamanders and wood frogs) to the greater landscape. Some of this energy is transferred out of the pools when predators feed on the protein rich eggs. Also, a large amount of energy departs the pools as young-of-the-year amphibians disperse in late summer or autumn into adjacent upland systems. These individuals are an important component of terrestrial food web.

Although wetland systems are essential for wetland dependent species, the quality of the nearby upland landscape greatly influences the functions and values of the aquatic resource. An intact wetland /upland matrix is especially important for the vernal pool species. Some of these species disperse several hundred feet from their breeding ponds into the adjacent upland habitat. For example, the spotted salamander typically travels up to 750 feet from its breeding pond, while the red-spotted newt may travel as far as 2,000 feet.

The DEIS has identified 11 pools within 200 feet of the proposed roadway, along with egg mass counts for spotted salamanders from April 2006 (wood frogs had already hatched out). Most of these pools are associated with the 200-acre habitat block, with vernal pools # 1 – 5 being close to I-93 and pools #6 – 10 being more in the interior of the habitat block. Because of the number of mapped vernal pools within 200 feet of the potential roadway and the nature of the landscape, it is likely that additional vernal pools are located within the large habitat block beyond the 200 feet mapping limit.

Alternatives

The 404(b)(1) guidelines generally prohibit the discharge of dredged or fill material if there is a practicable alternative to the discharge which is less environmentally damaging to the aquatic environment. 40 C.F.R. §230.10(a). An alternative is practicable if it is available and capable of being done in terms of cost, technology, and logistics in light of the basic project purpose. For this project, there have been several coordination meetings and we agree that the current proposed corridor (Alternative A) likely contains the alignment that would result in the least damage to the aquatic ecosystem.

However, it is less clear if the applicants have adequately minimized adverse impacts to aquatic resources on-site, especially by bridging and slight alignment shifts to reduce impacts to streams and vernal pools. The DEIS states that wildlife corridors, oversized

culverts, and extending bridge crossings will be evaluated later (after permit decisions are made) when more detailed design work is conducted. However, these evaluations are critical in helping us determine the likely adverse aquatic impacts, and that information bears directly on determining the least environmentally damaging alternative, the analysis of significance of impacts, and determining an appropriate compensatory mitigation plan for unavoidable adverse impacts. Therefore, the key concepts of wildlife movement need to be clarified at this stage to allow for those important analyses and determinations.

Given how close the proposed road will be to vernal pools, the dispersal distances for several of the vernal pool species, and the stated project purpose for induced development in this area, we strongly recommend that all the vernal pools in the 200-acre unfragmented habitat block be mapped and evaluated. This additional information, though somewhat labor intensive, would provide a much better understanding of the full range of anticipated secondary impacts, and would allow agencies to determine if shifting the highway to avoid the nearby vernal pools might impact other pools currently unmapped. This additional information would allow for a more definitive determination of which alignment would result in the least environmental harm to the aquatic resources in the study area.

For example, pool #6 (direct impact; 39 spotted salamander egg masses; tadpoles) and pool #7 (indirect impact; 63 spotted salamander egg masses; tadpoles) are quite valuable and efforts should be made to bridge a portion of this area and slightly modify the alignment. It appears that if the alignment can be pushed several hundred feet further north, the roadway could avoid direct impacts to pools 6, 8, and 10 as well as allow for larger buffers for pools 7 and 9. Several small bridges in this area would reduce aquatic impacts and allow salamanders, frogs and other small species to maintain some of their movement patterns to breeding and non-breeding areas.

Aquatic Impacts

The preferred route (Alternative A) would fill 3.4 acres of wetlands, including 5 vernal pools; relocate 2,350 linear feet of streams; add several exceedances of copper and zinc to streams; fill 0.34 acre-feet of floodplain; and bisect the undeveloped 200-acre forested habitat block. In addition to the vernal pools that would be filled directly, other pools that are a relatively short distance from the proposed roadway would be affected as well. The proposed compensatory mitigation plan consists of preserving 36 acres of land near protected areas in Londonderry; and, enhancing 1.8 acres of wetlands and protecting 8 acres along Shields Brook

Destruction of wetland acreage correlates with loss of functions and values including habitat destruction, reduced primary and secondary productivity, and alteration of hydrological functions (e.g., flood storage, low flow maintenance, nutrient and toxicant transformation, sediment trapping, groundwater discharge and recharge). The highway would add more than 10 acres of pavement to the landscape and destroy wetlands which help purify waters. Greater amounts of sediment, nutrients, and other pollutants of urban runoff, such as lead, oil, and gas, would enter tributary streams. Sediment causes turbidity, which reduces aquatic life and usually transports pesticides, heavy metals,

chlorides and other toxins into the streams.

The project would relocate 1,450 feet of a perennial stream and 900 feet of an intermittent stream. No details are provided in the DEIS that describe how these relocated streams would be rebuilt or restored, or how any remaining adverse impacts would be otherwise mitigated. The new roadway would also impact additional streams by expanding existing crossings. For example, at North High Street and Folsom Road, the culvert over Shields Brook will be extended 90 feet. The DEIS mentions that possible mitigation options such as bridges and oversized culverts will be considered during final design and after the NEPA and § 404 processes are complete. Again, it is important that these issues be addressed now, and in any event, must be addressed prior to the completion of the § 404 process. Leaving these issues to be addressed after completion of the NEPA and § 404 processes could inappropriately constrain the range of current options available to minimize and compensate for adverse impacts.

Five vernal pools would be filled completely, six other pools would be impacted indirectly (through temperature increases, roadway runoff, and the creation of barriers to migration), and several streams would be altered or degraded by runoff. Vernal pools 6 – 10 would be impacted in the interior of the large habitat block. Vernal pool #4 (50 spotted salamander egg masses; 50+ wood frog egg masses) and vernal pool #6 (39 spotted salamander egg masses; 1000s of wood frogs) are among the most productive pools that would be filled.

In addition to the direct footprint, highways cause ecological impacts to a much larger area, often referred to as the "road-effect zone" (R. T. T. Forman *et. al*., 2003. *Road Ecology*, Island Press). Some of these impacts include mortality from vehicles; the barrier effect of a road for species movement; soil compaction; altered temperature patterns, light levels and patterns, and surface water runoff patterns; and adding salts and excess nutrients to the aquatic environment.

Regarding indirect impacts, vernal pools would be especially vulnerable, as described by Dr. Aram Calhoun of the University of Maine in a publication authored with Michael Klemens (Calhoun and Klemens, 2002. *Best Development Practices...*in the northeast U.S., MCA Technical Pater No. 5, Wildlife Conservation Society). As Calhoun and Klemens note, "conservation strategies that focus only on protecting breeding pools and associated wetlands will most likely fail to maintain healthy amphibian populations. Protection of critical terrestrial habitat must also be a priority." They describe the critical terrestrial habitat as the land area within 750 feet from the pool. They recommend no development within the first 100 feet and less than 30% development within the entire 750 feet area to help ensure the long term viability of the pool. They report that development higher than 30% in this area results in declines in breeding populations. Thus, putting a major road within a few hundred feet of a vernal pool can greatly impact the pool, often, over time, to the point of total loss of amphibians from the pool.

The DEIS also modeled non-point source runoff for three metals Copper (Cu), Lead (Pb), and Zinc (Zn), as well as chloride (see additional comments below). Of the 8 discharge

points for Alternative A, the model predicts that 7 of the streams would exceed the EPA acute criteria for Cu and 6 streams would exceed the criteria for Zn. Even with best management practices (e.g., detention ponds), 5 of the 7 streams would still exceed the Cu criteria and 3 of the 6 streams would exceed the criteria for Zn. Further, background concentrations of pollutants were not considered in the model, so an accurate prediction of these secondary (indirect) adverse effects from operation and maintenance of the new roadway could not have been performed. Moreover, the DEIS does not describe how the predicted violations of water quality criteria for Cu and Zn would be addressed.

Within the 2.6 mile corridor, portions of the aquatic landscape have experienced cumulative adverse impacts from historical land disturbance. The new roadway would add to this historical loss and further fragment existing aquatic systems. The new portion of the roadway (1 mile) would bisect a habitat block of over 200 acres containing several identified vernal pools and streams. In addition, other pools, not identified and evaluated in the DEIS because they were located beyond the 200 feet limit of study from the new roadway, would likely experience indirect adverse impacts.

Furthermore, the new highway would promote the loss of additional vegetated land. As one of the project purposes is to promote economic development, and much of the 200-acre habitat block that the road would bisect and make accessible is zoned for industrial development, it is highly likely that the habitat block will be developed to some degree over the next 20 years. Much of the natural vegetation would be replaced by impervious surfaces which, in combination with increased sources of pollutants from expected residential and commercial development, would substantially increase non-point source pollutant loading via storm water runoff to nearby streams and aquifers. This development would also likely fill or otherwise degrade wetlands that help remove many of the pollutants in this runoff by storing and transforming chemicals such as nitrogen. Without increased protection now for these at-risk aquatic resources, the road and its resultant future growth would likely substantially degrade the refuge value of this area for most wetland dependent wildlife as well as the suitability of downstream portions of the streams for aquatic life.

Compensatory Mitigation

The proposed compensation plan includes preserving 36 acres of land near protected areas in Londonderry (site 3); and, enhancing 1.8 acres of wetlands and protecting 8 acres along Shields Brook (site 5). Although the DEIS identifies some good sites for compensatory mitigation, in light of the extent and nature of adverse direct and indirect impacts described above, we have serious concerns with the extent, scope, and nature of the proposed compensation plan. The most significant impacts would affect the 200-acre habitat block that contains highly valuable vernal pools and other wetlands, and the streams that will be relocated and otherwise degraded.

The proposed compensation plan does not include any vernal pool habitat creation, protection of sufficiently extensive areas around new pools (or existing pools that could remain viable after construction of the new roadway), or any details of how stream impacts will be addressed. It also does not appear that the DEIS investigated

opportunities to replace the vernal pools in other large, protected habitat areas. For example, proposed compensation sites such as #2 and #3 would appear to have good potential for vernal pool creation and preservation because they connect easily to other protected lands. Sites 4 and 5 seem too isolated for vernal pool creation, while site 1 has potential, but very little protected land nearby.

Because the proposed project and development it is intended to foster would cause serious direct, secondary (indirect), and cumulative adverse impacts to wetlands, including many vernal pools, and streams, we believe the proposed compensatory mitigation plan needs to be expanded to reflect the magnitude of this loss. Importantly, the DEIS does not appear to have considered any of the likely indirect impacts to the aquatic environment in forming the compensatory mitigation plan. Much of the 200-acre habitat block would be greatly compromised by the "road effect zone" and future development, resulting in potentially significant adverse impacts to wetland dependent species, especially those associated with vernal pools.

In summary, additional information about existing aquatic resources is needed in order to adequately evaluate compliance with the § 404 (b)(1) guidelines. EPA recommends that the following information be developed:

1. Identify and map all vernal pools within the 200-acre habitat block (see number 3, below).

2. Evaluate and determine appropriate locations to construct several small bridges and/or other structures to allow wildlife movement along and across the new one-mile roadway. Appropriate locations and types should be determined in the field based upon observations of preferred wildlife trails or other features that indicate where wildlife are more likely to pass. Conceptual details for existing stream crossings, especially at Shields Brook, should be discussed and developed now.

3. Evaluate shifting the proposed new roadway (Alternative A alignment) further north to avoid impacts to already identified valuable vernal pools, assuming the supplemental mapping of vernal pools under number 1, above, does not identify additional productive vernal pools within or near this shifted alignment.

4. Search for, identify, and evaluate suitable areas to create vernal pool habitat to compensate for the losses described above.

5. Evaluate the likely secondary impacts of induced development upon aquatic resources and factor that into the overall evaluation of project impacts and mitigation.

6. Once the work described in numbers 1 – 5, above, is complete, expand the compensatory mitigation plan to address the full range of unavoidable direct, secondary, and cumulative adverse impacts to aquatic resources. This expansion

would include vernal pool creation, additional land preservation around existing and created pools, and stream channel restoration.

Water Quality

Based on our review of the DEIS and past coordination with FHWA we offer the following observations/comments related to water quality issues for the project.

1. The proposed I-93 4A Exit Project is likely to significantly degrade water resources in Derry and Londonderry due to increased development and stormwater runoff, which will contribute to additional exceedances for chloride in violation of State water quality standards.

2. The stormwater and road salt modeling presented in the DEIS does not characterize existing water quality in ground water and streams, and the models are therefore uncalibrated by field data. Uncalibrated models yield unreliable results that frequently under- and over-predict impacts to flow and water quality. Although chloride measurements for select locations in the study area are summarized in Table 3.3-2 of the DEIS, they were not used in model simulations. Continuous monitoring records available at NHDES for nine I-93 project monitoring stations in the Beaver Brook watershed from 2004 to 2007 are not described or evaluated in the DEIS. For example, the DEIS omits mention of an acute violation of chloride that occurred in Shields Brook at Coteville Road (station 08-SHB) in Londonderry on March 2, 2007. Shields Brook, a major tributary of Beaver Brook, drains much of the project area. The peak chloride concentration was estimated to be 2,248 mg/l, which is 2.6 times the acute standard of 860 mg/l and 9.8 times the chronic standard of 230 mg/l.[2] This chloride peak occurred during a freezing rain storm of 1.20 inches (Manchester Airport, NOAA) and maximum air temperatures above freezing, releasing residual salt in snow piles and pavement surfaces. A graph of this chloride peak data was made available in a NHDES quarterly report to the FHWA, NHDOT and others on April 13th, 2007 but this information was not incorporated into the DEIS analysis.

3. During a June, 2006 project scoping meeting, EPA strongly recommended that potentially-impacted streams be sampled for chloride and other storm water constituents and that this information be incorporated into the DEIS analysis**.** This was not done. In fact, storm water modeling for just copper, lead and zinc, was apparently completed before the scoping meeting. Other important storm water parameters, such as sediment, bacteria, nutrients, PAHs, VOCs, cadmium and chromium, also were not characterized as part of the DEIS analysis. Unfortunately, as a result, valuable time to monitor stream and ground water quality and to establish baseline conditions in the project area has been lost.

4. Ground water quality, which the I-93 widening project has shown to be significantly affected by chronic chloride violations, is not discussed, modeled or described in the DEIS.

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2 In New Hampshire, chloride in surface water is regulated by Env-Ws 1703.21 [NH Water Quality Criteria for Toxic Substances].

5. During the June, 2006 scoping meeting, NHDES emphasized that the project would not be allowed to contribute any additional chloride in the Beaver Brook watershed, due to its existing chloride impairment and TMDL assessment. The DEIS does not adequately address how this prohibition can be met despite increased pollutant loading associated with new road construction, operation, and likely increases in impermeable cover due to future secondary development.

6. While public water supply wells are summarized and mapped in the DEIS, potential impacts from stormwater to both public and private drinking water wells near the proposed alternative (Tsienneto Road) are not described in the DEIS.

Based on our observations/comments above we recommend that the following supplemental information be provided:

1. A more comprehensive model for solute transport, such as HSPF (Hydrologic Simulation Program - Fortran), coupled with three other runoff models, the Storm Water Management Model (SWMM), the Program for Predicting Polluted Particle Passage through Pits, Puddles and Ponds (P8), and the Topographic-based Land Atmosphere Transfer Scheme (TOPLATS) should replace the FHWA storm water model used for the DEIS analysis**.** Used together, these four models simulate the transport pathways of concern: 1) catch basin and storm sewer hydraulics, 2) infiltration, surface runoff, sub-surface storm flow, watertable dynamics, and 3) reach and reservoir processes of runoff routing and storm runoff detention. All of these pathways influence pollutant fate and the total load leaving the watershed. The goal of this supplemental analysis is to more accurately predict the probability of water-quality violations associated with the project due to meltwater runoff and temporal climatic variations.

2. Monitoring of stream water and ground-water quality for stormwater and road salt parameters should commence as soon as possible to provide an appropriate data base for model input. Project proponents can build on existing QAPPs and SOPs developed for the I-93 Widening Chloride Assessment Project. For chloride measurement in streams and wells this autumn, winter and spring, NHDES has offered dataloggers to aid in this effort. As stated in previous discussions, EPA is willing to provide advice and field assistance as necessary.

3. Fish and macroinvertebrate assessments of perennial streams immediately downstream of the study's discharge points should be conducted prior to construction according to the NHDES Benthic Index of Biologic Integrity to assess baseline conditions for habitat viability.

Secondary and Cumulative Impacts

EPA, FHWA, and the project proponents have coordinated on the analysis of secondary (induced development) and cumulative impacts during the development of the EIS. This coordination began in February 2003 when the Exit 4A project was used as a case study

in training that FHWA and EPA sponsored on methods for evaluating secondary impacts (description of training attached; Exit 4A was the subject of group exercises at the Boston session on February 27, 2003). This was followed by a meeting on August 25, 2005 (minutes attached) in which EPA, NH DES, US Army Corps of Engineers, and others met with FHWA, NH DOT, the Towns, and their consultants on a method to use to analyze secondary and cumulative impacts for the Exit 4A project. After some discussion of the merits of different methods, there was agreement on an approach that would be used in the Exit 4A project. Data and information on potential growth likely to be stimulated by the project would be collected and analyzed, and the results would be presented to an expert panel for their review and comment. EPA and NH DES subsequently provided recommendations to the project consultants on panel candidates and provided information about a National Cooperative Highway Research Project guidebook on conducting expert panels.

In August 2006 EPA and NH DES met with FHWA, NH DOT, the Towns, and their consultant to review a draft of the socioeconomic analysis and draft sections of the DEIS. EPA and NH DES both provided comments on the analyses, and provided recommendations for revisions to improve the analysis. It was EPA's understanding that the project consultants would revise the draft report, as indicated in minutes of the August 14, 2006 meeting (copy attached). We can find no revisions to the analysis of secondary impacts, despite the passage of 11 months between the August 2006 meeting and receipt of the DEIS. We are concerned that the fundamental flaws in the analysis that we discussed at the meeting in August 2006 remain. Our comments on the DEIS analysis are also in accord with training sponsored by FHWA and NH DOT on August 27-29, 2007 on methods for analyzing indirect and cumulative effects.

Specifically, our comments are as follows:

1. The DEIS does not address the fundamental question of what would not happen 'but for' the proposed project. In other words, what changes in population and employment are likely to be attributable to construction of Exit 4A, and would not occur but for construction of the exit? The EIS should analyze this issue, instead of simply presenting forecasts made by the state or the I-93 Widening project Expert Panel for other purposes, and which are not based on an assumption that Exit 4A will be constructed.

2. The DEIS presents no estimates of employment changes that are likely to result from the project. This is a serious flaw since as stated in the Project Description and Need, one of the project purposes is:

"…providing improved Interstate access for commercial and industrially-zoned lands near NH Route 28 in both Derry and Londonderry, thus allowing for the planned and orderly development of such lands to further locally-defined economic development goals and tax base diversification…"

Thus, employment growth attributable to the project is reasonably foreseeable, and as required under NEPA should be analyzed. We note, however, that the analysis should

not be limited to growth likely to occur in the lands that will be more accessible from Exit 4A, but also should include project-induced changes in employment in the entire study area.

3. The DEIS does not translate population and employment changes into environmental impacts. There should be a discussion of likely locations of growth and potential environmental impacts. Instead there are very general statements throughout the document to the effect that predicting environmental impacts is not feasible without knowing the specific locations of future development activities. The point of the analysis is not to pinpoint specific locations of future development activities, but instead to project in general where growth is most likely to go, and what the associated environmental impacts of that growth may be. As an obvious example, the vacant and underutilized lands near proposed Exit 4A are very likely to be developed, since that is one of the project purposes, yet no analysis is presented of the likely environmental impacts of such development. The analysis also should consider what might happen to population and employment patterns if local growth caps are eliminated, since as the DEIS indicates "…growth control measures are subject to legal challenge and legislative changes."

On a minor point, in chapter 8 there is no mention of a Socioeconomic Impact Peer Review Meeting, which we understood occurred on March 2, 2006, nor is there a list of attendees. We recommend that both be included in the EIS, as well as an indication of whether the Peer Reviewers were given an opportunity to read and comment on the draft report, as we recommended in August 2006.

Air Quality

General

The proposed Interchange 4A Project is located in the towns of Derry and Londonderry, Rockingham County, New Hampshire, which is in the New Hampshire portion of the Boston-Manchester-Portsmouth Southeast, New Hampshire moderate eight-hour ozone (O_3) non-attainment area.

The DEIS states that the impacts from volatile organic compounds (VOCs) and nitrogen oxides (NOx) due to this project have been accounted for in New Hampshire's Transportation Air Quality Conformity Determination and no project-specific (mesoscale/regional) air quality analysis will be conducted for the EIS. However, since the project area is located within an 8-hour ozone nonattainment area, EPA believes regional emission analyses of the no-build and build alternatives is appropriate to compare level of ozone precursor emissions VOCs and NOx, and to provide more complete information to compare alternatives.

In addition, induced growth associated with the various alternatives, and the impact of this future growth on local vehicle miles of travel and motor vehicle emissions should be evaluated through mesoscale air quality analyses of the no-build and build alternatives.

Modeling

To demonstrate that the proposed project will not create a NAAQS violation, a microscale (hot spot) assessment for carbon monoxide (CO) was analyzed. The DEIS did not include the air quality technical support documentation for the microscale carbon monoxide air quality analysis. Therefore, EPA is unable to independently evaluate the air quality analyses, modeling, methodology or assumptions. EPA requests all MOBILE6.2 input files and external files used to generate the mobile source carbon monoxide emission factors, and CAL3QHC input/output files used in the microscale modeling analysis be submitted to EPA New England and made available to others to view on request. These files can be provided as a technical appendix, via CD, e-mail, or provided on a FTP site for downloading.

Construction Impacts

The DEIS statement that emissions from properly maintained construction equipment and trucks are not likely result in adverse impacts on ambient air quality standards (DEIS page 4-28). Given public health concerns about diesel exhaust from heavy duty diesel trucks and other heavy duty construction equipment, EPA does not agree with this conclusion and recommends that measures be implemented to reduce fine particle emissions emitted from diesel engines during construction. Emissions from older diesels engines can be controlled with retrofit pollution control equipment such as diesel oxidation catalysts or particulate filters that can be installed on the exhaust of the diesel engine. Retrofits have been successfully applied to many diesel engines across the country and oxidation catalyst technology has been successfully applied to construction equipment used on several projects in the Northeast, including the Central Artery/Third Harbor Tunnel project in Boston and the Q Bridge Reconstruction project near New Haven, CT. Based on this success, some New England States (e.g., MA and CT) are now requiring construction equipment to be retrofitted with control devices or use clean fuels.

We recommend that the FEIS identify the construction mitigation measures the Towns are committed to implement. Retrofit technologies may include EPA verified emission control technologies and fuels and CARB-verified emission control technologies. List of these control technologies can be accessed at http://www.epa.gov/otaq/retrofit/verif-list.htm.

National Ambient Air Quality Standards

The table for the "National and New Hampshire Ambient Air Quality Standards," [Table 3.2-1 on page 3-15 of the Draft EIS] should be updated to reflect revisions to the National Ambient Air Quality Standards (NAAQSs). Effective December 18, 2006, [3] the PM_{10} annual standard of 50 $\mu g/m^3$ was revoked. In addition, in the same rulemaking, the 24-hour average $PM_{2.5}$ standard was lowered to 35 $\mu g/m^3$. The National Ambient Air Quality Standards can be found on EPA's web site at URL address: http://www.epa.gov/air/criteria.html.

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3 National Ambient Air Quality Standards for Particulate Matter, Final Rule, Tuesday, October 17, 2006, (71 FR 61144-61233).